

### **REMARKS**

In view of the above amendments and the following remarks, reconsideration of the rejections contained in the Office Action of September 9, 2004 is respectfully requested.

In order to make necessary editorial corrections, the entire specification and abstract have now been reviewed and revised. As the revisions are quite extensive, the amendments to the specification and abstract have been incorporated into the attached substitute specification and abstract. For the Examiner's benefit, a marked-up copy of the specification indicating the changes made thereto is also enclosed. No new matter has been added by the revisions. Entry of the substitute specification is thus respectfully requested.

The Examiner rejected claims 72 and 73 under 35 USC § 112, second paragraph, as being indefinite. However, as indicated above, previously-pending claims 42-107 have been cancelled and replaced with new claims 108-128. The new claims have been carefully drafted so as to fully comply with all of the requirements of 35 USC § 112. Therefore, it is respectfully submitted that the Examiner's formal rejections under § 112 are not applicable to the new claims.

The Examiner rejected all of the previously-pending claims 42-107 in view of the prior art, including the Tang reference (USP 5,365,889); the Pillai reference (EP 0312840 A1), the Nagato '805 reference (USP 6,139,805), the Nagato '599 reference (USP 5,513,599), the Ahland reference (USP 4,833,877), and the Fujimura reference (USP 5,922,090). However, as indicated above, the original claims have now been cancelled and replaced with new claims 108-128, including new independent claims 108, 112, 116, 120, and 124. For the reasons discussed below, it is respectfully submitted that the new claims are clearly patentable over the prior art of record.

Each of new independent claims 108, 112, 116, 120, and 124 is directed to a fluidized-bed gasification and combustion furnace that comprises a gasification furnace having a furnace bottom, a combustion furnace having a furnace bottom, a partition wall dividing the gasification furnace from the combustion furnace, a first diffusion device on the furnace bottom of the gasification furnace, a second diffusion device on the furnace bottom of the combustion furnace, and a lower opening in the partition wall for introducing a fluidized medium into the combustion furnace. In addition, an incombustible material discharging port is provided *between the furnace bottom of the gasification*

*furnace and the furnace bottom of the combustion furnace for discharging incombustible material therethrough.*

The arrangement of the incombustible material discharging port, in combination with the other features recited in each of the claims, provides significant advantages. In particular, it is not necessary to previously crush material introduced into the gasification furnace to be gasified, even if the material includes large-sized incombustible material, because the incombustible material can be easily discharged through the incombustible material discharging port. Therefore, resistance to the flow of a fluidized medium through the lower opening in the partition wall between the gasification furnace and the combustion furnace will be significantly reduced due to the discharge of the incombustible material, thereby improving the circulation of the fluidized medium between the gasification furnace and the combustion furnace. As a result, it is not necessary to supply large amounts of fluidizing gas to move or direct the fluidized medium.

The Tang '889 reference discloses a fluidized bed reactor including a pyrolysis vessel 30 and a combustion vessel 32 separated by a partition wall 22. However, the Tang reference does not disclose or even suggest an incombustible material discharging port, or an incombustible material discharging port that is arranged between a furnace bottom of a gasification furnace and a furnace bottom of a combustion furnace.

The Pillai reference discloses a PFBC power plant including a gasification section 14 and a combustion section 16 divided by a partition 17. The combustion section 16 includes a bottom 30, and the gasification section 14 includes a bottom 18. Although the Pillai reference discloses an ash discharging port with a rotary vane feeder 42, the Pillai reference does not disclose or even suggest an incombustible material discharging port between the bottom of the gasification section 14 and the bottom of the combustion section 16.

The Nagato '599 reference discloses fluidized-bed boiler including a gasifier 207 and an oxidizer 208, as illustrated in Figure 12. However, the Nagato '599 reference does not disclose or even suggest an incombustible material discharging port, or an incombustible material discharging port that is arranged between a furnace bottom of a gasification furnace and a furnace bottom of a combustion furnace.

The Nagato '805 reference discloses a fluidized-bed reactor including a main combustion chamber  $R_{cu}$  and a thermal energy recovery chamber  $R_{th}$ , as illustrated in Figure 6 (see column 9, lines 32-36). As also illustrated in Figure 6, an incombustible material discharge port 28 is located between *the thermal energy recovery chamber and the main combustion chamber*. However, the Nagato '805 reference does not disclose or even suggest a gasification furnace. Therefore, the Nagato '805 reference also does not disclose or even suggest an incombustible material discharging port that is arranged *between a furnace bottom of a gasification furnace and a furnace bottom of a combustion furnace*.

The Fujimura reference and the Ahland reference also do not disclose or suggest an incombustible material discharging port arranged as recited in new independent claim 108. Therefore, because none of the references of record disclose or even suggest an incombustible material discharging port that is arranged between a furnace bottom of a gasification furnace and a furnace bottom of a combustion furnace, one of ordinary skill in the art would not be motivated to modify or combine the references in a manner that would result in the invention recited in any of new independent claims 108, 112, 116, 120, or 124. Accordingly, it is submitted that these new independent claims and the claims that depend therefrom are clearly patentable over the prior art of record.

In view of the above amendments and remarks, it is submitted that the present application is now in condition for allowance. However, if the Examiner should have any comments or suggestions to help speed the prosecution of this application, the Examiner is requested to contact the Applicant's undersigned representative.

Respectfully submitted,

Shuichi NAGATO et al.

By: 

W. Douglas Mahm  
Registration No. 44,142  
Attorney for Applicants

WDH/gtg  
Washington, D.C. 20006-1021  
Telephone (202) 721-8200  
Facsimile (202) 721-8250  
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